Contents: Mixed Waste Management

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Section	Overview of Content (see section for full process)
Introduction	
1. Generating Waste	• Ensure training is current. • Segregate, package, and label waste in appropriate containers. • Maintain inventory. • Assign a Container Custodian if B-12, B-25, or B-52 containers are selected. • Ensure the FSS or designee surveys and smears the waste container. • Place waste into approved Accumulation Area.
2. Completion of Waste Control Forms	• Complete RWCF or ANMWCF. • Identify quantity of waste and characterize it. • Transfer RWCF or ANMWCF number onto Mixed Waste Label and Radioactive Waste Inventory Form. • Submit forms to the 90-Day Accumulation Area Manager. • Survey and smear the waste container. • Sign and date certification statement. • Submit RWCF or ANMWCF to the Waste Accumulation Area Manager. • Notify the Waste Accumulation Manager before placing waste into accumulation area.
3. Establishing a Mixed Waste Satellite Accumulation Area	• Ensure training is current. • Register the area. • Locate satellite area at or near the point of waste generation. • Dedicate a separate area for mixed waste. • Post accumulation area with appropriate signs.
4. Operating a Mixed Waste Satellite Accumulation Area	• Keep waste containers secured. • Segregate wastes according to hazard class. • Place containers holding liquid wastes in secondary containment. • Store only compatible wastes in the same container. • Maintain waste control forms. • Plan transfer and disposal so that quantity and storage time limits are not exceeded.
5. Establishing a 90-Day Mixed Waste Accumulation	• Ensure training is current.

Area	• Register area with WM. • Locate area in appropriate shelter. • Provide secondary containment for all liquid mixed wastes. • Ensure safety equipment is accessible. • Post area with appropriate signs.
6. Operating a 90-Day Mixed Waste Accumulation Area	• Submit waste control forms to WM. • Schedule pick-up and transfer waste to the WM Facility. • Inspect the area weekly. • Maintain current copy of Contingency or Emergency plan in area. • Lock the area to limit access.
7. PCB Mixed Waste Management	• Ensure PCB waste is picked up by WM within 30 days of it being declared out of service. • Fill in PCB information on the back of the RWCF. • Segregate, package, and label PCB waste as required. • Take adequate spill control measures. • Post entrance to the accumulation area.
8. Waste Certification	• Follow all procedures to ensure mixed wastes are properly managed and transferred to WM for waste certification and final disposition.
Definitions	

Exhibits

Mixed Waste Generator Characterization Guidance

Mixed Waste Label

Mixed Waste Yellow Bag

Forms

90-Day Hazardous/Mixed Waste Accumulation Area Weekly Inspection Checklist

Mixed Waste 90-Day Accumulation Area Registration Form

Training Requirements and Reporting Obligations

This subject area contains training requirements. See the Training and Qualifications Web Site.

This subject area may or may not contain reporting obligations. See the subject area until obligations are listed here.

References

40 CFR 262.11, "Hazardous Waste Determination" (EPA 1987)

Chemical Management System web site

DOE Order 435.1, *Radioactive Waste Management*

EPA EnviroSense web site

EPA's Technology Innovation Office Clu-In web page

EPA SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*

Hazardous Waste Management Subject Area

Hazardous Waste Management Subject Area

Material Safety Data Sheet (MSDS) Search, Chemical Management System web site (*Limited Access)

PCB Management Subject Area

Pollution Prevention and Waste Minimization Subject Area

Radioactive Waste Management Subject Area

Radioactive Waste Management Basis Program Description

Radiological Control Manual Program Description

Regulated Medical Waste Management Subject Area

Spill Response Subject Area

Training and Qualifications Web Site

*Access Limited to BNL Staff and Authorized non-BNL Staff

Standards of Performance

All staff and guests shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

All staff and guests shall promptly report accidents, injuries, ES&H deficiencies, emergencies, and off-normal events in accordance with procedures.

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

Managers shall ensure that work is planned to prevent pollution, minimize waste, and conserve resources, and that work is conducted in a cost-effective manner that eliminates or minimizes environmental impact.

Before waste is generated, managers shall ensure that it has a funded and available disposition pathway. Managers shall ensure that all hazardous materials and waste have an identified owner who is accountable for its proper disposition.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

All staff and users shall ensure that they are trained and qualified to carry out their assigned responsibilities, and shall inform their supervisor if they are assigned to perform work for which they are not properly trained or qualified.

All staff and users shall ensure that environmental effluents, emissions, and wastes associated with their work are as low as reasonably achievable (also referred to as "E

associated with their work are as low as reasonably achievable (also referred to as "E-ALARA").

Management System

This subject area belongs to the **Environmental Management System** management system.

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Introduction: Mixed Waste Management

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

This subject area describes how waste generators identify, package, label, and manage mixed waste to eliminate or minimize the impact on the environment. The following topics are discussed in this subject area:

- Identifying/characterizing waste;
- Segregating waste;
- Packaging waste;
- Labeling waste;
- Completion of Radioactive Waste Control Forms (RWCFs) and Accountable Nuclear Material Waste Control Forms (ANMWCFs);
- Establishment, operation, and maintenance of a Mixed Waste Satellite Accumulation Area;
- Establishment, operation, and maintenance of a 90-Day Mixed Waste Accumulation Area;
- PCB mixed waste management;
- Waste certification.

Brookhaven National Laboratory (BNL) is committed to integrating environmental stewardship into all facets of our missions. This stewardship includes the proper management of all mixed waste streams created during the performance of BNL operations and research programs.

Requirements for managing radioactive waste are established in U.S. Department of Energy (DOE) Order 435.1, *Radioactive Waste Management*, requiring DOE organizations that generate radioactive waste to implement a waste certification program to ensure that waste acceptance criteria are met. The BNL Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description defines the program structure, logic, and methodology for waste certification. BNL's compliance with the applicable requirements of DOE Order 435.1 is accomplished by a DOE-approved Radioactive Waste Management Basis (RWMB) for Brookhaven National Laboratory in the Radioactive Waste Management Basis Program Description, which includes the exemption and timeframe requirements for the staging and storage of routine and non-routine radioactive wastes. This document describes the BNL policies, procedures, plans, and controls demonstrating that BNL has the management systems, administrative controls, and physical controls established to comply with DOE Order 435.1.

New or modified operations or activities that do not fall within the scope of the RWMB must be documented and approved prior to their implementation. Organizations and/or generators should refer to the Work Planning and Control for Experiments and Operations Subject Area and inform the Waste Management Program of any such proposed operations or activities.

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Subject Area: ***Mixed Waste Management***

1. Generating Waste

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all mixed waste generators.

Required Procedure

Step 1	Ensure your training status as a generator of hazardous waste and radioactive waste is up-to-date prior to generating waste. • To ensure you are within the one-year qualification period for the HP-RCRIGEN3 (Hazardous Waste Generator) course, and the two-year requalification period for the HP-RADIGEN (Radioactive Waste Generator) course, consult the Training and Qualifications Web Site, or contact your Department/Division's Training Coordinator. • If your training is not current, attend training in the proper methods for handling, documenting, and disposing of radioactive waste prior to generating and/or managing mixed waste. For additional information on training requirements, contact the Mixed Waste Program Manager.

Step 2	Segregate waste in accordance with the following
	• Segregate short half-life isotopes (less than 90 days) from long half-life isotopes for Decay in Storage (see the Decay in Storage (DIS) Record exhibit in the Radioactive Waste Management Subject Area).
	• Segregate liquids from solids.
	• Segregate waste by waste classification:
	  ○ Low-Level Mixed Waste
	  ○ Liquid Low-Level Mixed Waste (LLLMW)
	  ○ State Regulated Low-Level Radioactive Waste (contact the Environmental Subject Matter Expert on Mixed Waste Management for further information)
	  ○ Accountable Nuclear Material Mixed Waste
	  ○ For other types of mixed waste, contact your supervisor or the Mixed Waste Program

	Manager. • Segregate compactible waste from noncompactible waste.

Step 3	Place waste in a Mixed Waste Yellow Bag or other packaging (e.g., 55-gallon drum, B-12, B-25, or B-52 containers) approved for use by the Waste Management Program.
	
	• Collect mixed waste only in containers that meet the following criteria:
	  ○ Good condition, without any holes, dents, or other faults that might impair its proper containment. Do not place sharps in a mixed waste bag (see the Regulated Medical Waste Management Subject Area for definitions and regulations for sharps).
	  ○ Constructed from, or lined with, a material that is compatible with the mixed waste to be stored.
	  ○ Ensure the package contains the material and prevents the spread of contamination during handling and transport.
	• Drain all fluids from mixed waste (e.g., vacuum pumps) prior to placement in package.
	• No free liquids can be in packages of mixed solid waste.
	• Provide secondary containment for all liquid mixed wastes to hold 10% of total volume, or 100% of the volume of the largest container.
	
	Note: A Radioactive Waste Inventory Form (see the Radioactive Waste Management Subject Area) must be maintained to ensure documentation of a detailed inventory of the waste container when loading solid waste into a final waste package (e.g., B-12, B-25, or B-52), and a point of generation inspection is conducted by a Waste Management Representative or waste operations personnel (i.e., waste package verifier). The final waste package (e.g., B-12, B-25, or B-52 containers) must have an even load distribution.

Step 4	Ensure there are no void spaces in packages (e.g., B-12, B-25, or B-52 containers) of noncompactible solid low-level mixed waste that exceed two inches across or 10% of the total volume. If B-12, B-25, or B-52 containers are selected, the Mixed Waste Accumulation Area Manager assigns a Container Custodian for each package. The Container Custodian does the following • Inspects packagings for deficiencies; • Ensures that waste parcels added to packagings are tracked or inventoried (i.e., inventory list, checklists); • Maintains control over packagings while they are being filled and prior to closing for pick up and transport to an approved Treatment Storage and Disposal Facility (TSDF) or to Waste Management. **Note:** The Container Custodian should contact their supervisor or Mixed Waste Program Manager if unsure of the type of packaging required for waste parcels.
Step 5	Maintain an inventory of articles added to the waste container sufficient to characterize the waste for storage, shipment, and disposal. • Include the date, article description, radionuclides, RWCF or ANMWCF number, weight, and activity (i.e., curie, microcurie) of the waste item(s). **Note:** Keep the Radioactive Waste Inventory Form at or near the waste package

	(s).
Step 6	Seal the Mixed Waste Yellow Bag(s) with duct tape using a J-Seal for Bags (see exhibit in the Radioactive Waste Management Subject Area). • Fill in the generator and hazardous waste sections on the Mixed Waste Label and attach the label to the package(s). **Note:** The RWCF or ANMWCF should be completed at the time the LLMW bag, package, or other container is sealed. Items not intended for waste should not be stored in LLMW bags, containers, or packages, or have any waste markings on them.
Step 7	Ensure the Facility Support Representative or designee surveys the package (see Table 2-2, Definition of Removable and Fixed Contamination Levels in the Radiological Control Manual Program Description). • Complete the radiological information section of the Mixed Waste Label.
Step 8	Put the waste into the appropriate waste storage area. • See the section Establishing a Mixed Waste Satellite Accumulation Area if the waste is going to a Mixed Waste Satellite Accumulation Area. • See the section Establishing a 90-Day Mixed Waste Accumulation Area if the waste is going to a 90-Day Mixed Waste Accumulation Area.

Guidelines

If a material is determined to have any intrinsic value before declaring it as waste, the following groups should be notified of the material's availability:

- Staff within your Department/Division;
- Staff outside your Department/Division (for examples, see the Laboratory's Chemical Management System web site, or contact the Property & Procurement Management Division);
- Outside the Laboratory (for examples, see the EPA EnviroSense web site).

References

Chemical Management System web site

EPA EnviroSense web site

Hazardous Waste Management Subject Area

Radioactive Waste Management Subject Area

Radiological Control Manual Program Description

Regulated Medical Waste Management Subject Area

Training and Qualifications Web Site

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Subject Area: ***Mixed Waste Management***

3. Establishing a Mixed Waste Satellite Accumulation Area

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all waste generators.

Required Procedure

Step 1	Ensure your training status as a generator of hazardous and radioactive waste is up-to-date. • To ensure that you are within the two-year qualification period for the HP-RADIGEN (Radioactive Waste Generator) course and HP-RCRIGEN3 (Hazardous Waste Generator), consult the Training and Qualifications Web Site or contact your Department/Division's Training Coordinator. • If your training is not current, then attend training in the proper methods for handling, documenting, and disposing of radioactive waste. For additional information on training requirements, contact the Radioactive Waste or Hazardous Waste Program Manager.
Step 2	Register the area with Waste Management by completing the Mixed Waste 90-Day Accumulation Area Registration Form.
Step 3	Locate the Satellite Accumulation Area at or near the point of generation. • Each Satellite Accumulation Area must be under the control of the waste generator. **Note:** The temperature of the stored waste must always remain above the waste's freezing point and below its auto-ignition point, which can be obtained from the Material Safety Data Sheet (MSDS), reference literature, or through analysis.
Step 4	Dedicate a separate area (i.e., post with a Satellite Accumulation Area Basic Rules Sign [see the Hazardous Waste Management Subject Area]) for the collection of mixed waste and ensure its segregation from nonradioactive hazardous waste and radioactive waste by posting the area or erecting a physical barrier.

	• The area should be located to protect the accumulated waste from damage due to weather (e.g., protection from temperature extremes). • Areas must accommodate material handling equipment and must have unobstructed access for waste inspections and pick-ups.
Step 5	Post the Satellite Accumulation Area Basic Rules Sign (in the Hazardous Waste Management Subject Area), and the Radioactive Waste Accumulation Area Basic Rules Sign and Prohibited Articles in Radioactive Solid Waste Packages sign (in the Radioactive Waste Management Subject Area), at or near the accumulation area.

Guidelines

Managers should maintain a current list of Satellite Accumulation Areas.

The base of the secondary containment should be sloped or otherwise designed to drain and remove liquids resulting from leaks and spills unless the containers are elevated, or are otherwise protected from contact with spilled liquids.

All sinks and floor drains in the vicinity should be plugged when they are not in use to prevent possible spillage from entering the building's sanitary sewage system.

References

Hazardous Waste Management Subject Area

Material Safety Data Sheets (MSDS) Database Query website (*Limited Access)

Radioactive Waste Management Subject Area

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Subject Area: ***Mixed Waste Management***

4. Operating a Mixed Waste Satellite Accumulation Area

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all waste generators.

Required Procedure

Step 1	Keep all waste containers closed at all times except when waste is being added or removed.
Step 2	Segregate wastes according to their hazard class (see the Hazard Class exhibit in the Hazardous Waste Management Subject Area). If the waste contains PCB's, go to the section PCB Mixed Waste Management for additional instructions. • Place containers of waste in the waste accumulation area in a way that minimizes the risk of possible interaction of incompatible wastes.
Step 3	Provide secondary containment for all liquid mixed wastes to hold 10% of total volume, or 100% of the volume of the largest container.
Step 4	Store only compatible wastes in the same container. • For information on container/waste compatibility, see the Examples of Incompatible Chemicals exhibit in the Hazardous Waste Management Subject Area.
Step 5	Plan disposal so that the quantity of waste stored in the Satellite Accumulation Area does not exceed limits. • Do **not** store more than 55 gallons (7.5 cubic feet or 210 liters) of a mixed waste or one quart (950 milliliters) of an acutely hazardous (mixed) waste within a Satellite Area.
Step 6	Handle and store waste containers in a way that prevents leakage or spillage of the contents. • Containers are to be stored in an environment that will prevent the freezing of the contents or

	exposure to excessive heat. • Containers are not to be left either partially or fully blocking aisles or other access ways. • Containers are not to be stored where the potential exists for leakage to enter sinks or drains.
Step 7	Transfer the mixed waste to your Department/Division's 90-Day Mixed Waste Accumulation Area within three days after reaching 55 gallons (7.5 cubic feet or 210 liters), **or** one quart (950 milliliters) of acutely hazardous (mixed) waste.
Step 8	If more than one waste generator is contributing to the satellite area, they • Only add compatible wastes to any given container. • Record waste type, quantity, curie content, and specific radionuclide on a Radioactive Waste Inventory Form in the Radioactive Waste Management Subject Area. • Close all containers of waste at all times except when waste is being added or removed.

Guidelines

Once a waste container is full (regardless of its capacity), it should be moved to the 90-Day Mixed Waste Accumulation Area.

References

Hazardous Waste Management Subject Area

Radioactive Waste Management Subject Area

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Subject Area: ***Mixed Waste Management***

2. Completion of Waste Control Forms

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all mixed waste generators.

Required Procedure

Complete the Radioactive Waste Control Form (RWCF) (or Accountable Nuclear Material Waste Control Form (ANMWCF), as appropriate) in the Radioactive Waste Management Subject Area for each waste package.

Step 1	On the RWCF or ANMWCF, clearly print the following information: • Generator's name; • Department/Division; • BNL extension; • Life Number; • Department/Division responsible for generating the waste; • Account number for waste disposal; • The accumulation area building number, and • The date that the waste was placed into the 90-Day Accumulation Area.
Step 2	Identify the quantity of waste, including the following items: • Use one RWCF or ANMWCF for each package; • Describe the package type (e.g., plastic bag, B-25 bin); • Provide the volume of the waste **only** (gallons for liquids, cubic feet for solids) and the weight of waste **only** (in pounds) in the package. **Note:** Report specific waste weight for higher activity items such as sources and/or accountable nuclear material (i.e., if the actual weight is less than 1 lb., record the weight in grams or to the nearest one hundredth of a pound on the RWCF).

Step 3	Characterize the waste and complete the RWCF or ANMWCF as follows:
	
	• Describe the waste and the process that generated the waste.
	• List the physical components of the waste with the percentages by volume. Use the inventory form to determine this.
	• List the chemical components of the waste with the percentages by volume. Use the Material Safety Data Sheet (MSDS) Search to determine this.
	• List the radioactive isotopes and the activity in microcuries.
	  ○ Use the inventory form for guidance.
	  ○ You may determine the concentration of a radionuclide by either of the following methods:
	  ▪ Direct methods [e.g., gamma-ray spectroscopy, scintillation counter (H3) or Dose-Rate-to-Activity Conversion]
	  ▪ Indirect methods such as radionuclide material accountability (mass balance) or the use of scaling factors that relate the inferred concentration of one radionuclide to another that is measured, if there is reasonable assurance that the indirect methods can be correlated with actual measurements.
	  ○ Note any Transuranic (TRU) radionuclide present in the waste in concentrations exceeding 1 nanocurie per gram (1 nCi/g).
	  ○ Report any radionuclide that accounts for more than 1% of the total radiological activity of the waste.
	  ○ Select the method of assay or analysis used to determine radionuclide distribution and concentration, and attach copies of all supporting characterization documentation.
	
	Refer to the Liquid Waste Tank Mixing and Drum Sampling Guidance Document in the Radioactive Waste Management Subject Area for protocols on sampling and/or characterizing waste items.
	
	For additional characterization guidance, refer to the Mixed Waste Generator Characterization Guidance exhibit, or contact your Waste Management Representative for assistance. If the Toxicity Characteristic Leaching Procedure (TCLP) is required on your waste item or stream, include elemental zinc (State regulated).
	
	• Note any special hazards on the "Precautions" line (e.g., shards of glass, highly radioactive [greater than or equal to 100 µR/hr contact], etc.).
	
	Note: If isotopic content is estimated based on mass or indirect methods were used to characterize the waste, the waste item(s) must be weighed and isotopic calculations and characterization methods used must be forwarded with the RWCF or ANMWCF.

Step 4	Transfer the RWCF or ANMWCF number onto the Mixed Waste Label and the Radioactive Waste Inventory Form in the Radioactive Waste Management Subject Area and attach the forms to the characterization documentation.
Step 5	Ensure the Facility Support Representative surveys and smears the waste container and completes the For Facility Support section on the RWCF or ANMWCF prior to submitting to Waste Management for review and approval. • Waste containers must be free of outside contamination. • The surveyor is required to sign, provide their life number, and date the RWCF. • The surveyor must transfer survey information onto the Mixed Waste Label.
Step 6	Review, sign, and date the certification statement.
Step 7	Submit the RWCF or ANMWCF and supporting characterization documentation to the Mixed Waste Accumulation Area Manager.
Step 8	Notify the Waste Accumulation Manager prior to placement of waste into the Waste Accumulation Area.

Step 9	Ensure the waste is moved to the Waste Accumulation Area. **Note:** Complete a RWCF or ANMWCF for the item before placing waste into the Mixed Waste Accumulation Area.

Guidelines

Staff should use only permanent blue or black ink when completing waste control forms.

Staff should use information from the Radioactive Waste Inventory Form to complete the Radioactive Waste Control Form (or Accountable Nuclear Material Waste Control Form (ANMWCF), as appropriate) in the Radioactive Waste Management Subject Area.

References

Material Safety Data Sheet (MSDS) Search, Chemical Management System web site (*Limited Access)

Radioactive Waste Management Subject Area

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Subject Area: ***Mixed Waste Management***

5. Establishing a 90-Day Mixed Waste Accumulation Area

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all managers of 90-Day Mixed Waste Accumulation Areas.

Required Procedure

Step 1	Ensure your training status as both a Waste Generator and 90-Day Accumulation Area Manager is up-to-date. • To ensure that you are within the qualification periods for the HP-RCRIGEN3 course (one year), the 90-Day course (one year), and the HP-RADIGEN course (two year), consult the Training and Qualifications Web Site or contact your Department/Division's Training Coordinator. If your training is not current, then attend training in the proper methods for handling, documenting, and disposing of hazardous and radioactive waste. For additional information on training, contact the Mixed Waste Program Manager.
Step 2	Dedicate a separate area in the 90-Day Mixed Waste Accumulation Area or Radioactive Waste Accumulation Area for the collection of mixed waste. Ensure its segregation from nonradioactive hazardous waste or nonhazardous radioactive waste by posting the area or using a physical barrier. If establishing a Mixed Waste Accumulation Area within a 90-Day Hazardous Waste Accumulation Area, follow all requirements specified in the Radiological Control Manual Program Description.
Step 2	Register the area with the Waste Management (WM) Program. Complete the Mixed Waste 90-Day Accumulation Area Registration Form and send it to WM.
Step 3	Locate the area in a fully enclosed shelter (e.g., within a building or in a Hazardous Waste Storage Module as depicted in the Hazardous Waste Management Subject Area) that is completely isolated from the outside. • Containers are to be stored in an environment that will prevent the freezing of the contents or exposure to excessive heat. • Areas must accommodate material handling equipment and must have unobstructed access for WM vehicles.
Step 4	[illegible]

Step 4	Provide secondary containment for all liquid mixed wastes to hold 10% of total volume, or 100% of the volume of the largest container. If the waste contains PCBs, see the section PCB Mixed Waste Management for additional instructions. • All sinks and floor drains in the vicinity must be plugged to prevent possible spillage from entering the building's sanitary sewage system. • The base of the secondary containment must be sloped or otherwise designed to drain and remove liquids resulting from leaks and spills unless the containers are elevated or are otherwise protected from contact with spilled liquids (e.g., see the Photo of Hazardous Waste Storage Module and Rubber Webbing Mats exhibit in the Hazardous Waste Management Subject Area).
Step 5	Ensure the area is large enough to meet the following criteria: • Proper segregation of incompatible wastes according to hazard class. ○ For examples of incompatible wastes, refer to the Examples of Incompatible Chemicals exhibit in the Hazardous Waste Management Subject Area. • Unobstructed access within the area by means of one or more aisles, each a minimum of thirty (30) inches (77 centimeters) wide.
Step 6	Ensure the following equipment is accessible to the 90-Day Mixed Waste Accumulation Area: • A communication device that is immediately available (i.e., not behind a locked door or obstructed), and within sight of the area, or that can be easily found by following a sign(s). In order of preference, this device should be a telephone, fire-alarm pull-box, or hand held two-way radio. • A Type ABC fire extinguisher mounted within thirty feet (nine meters) of the Accumulation Area. A Type D fire extinguisher is also required, similarly mounted, if flammable metals are to be accumulated in the area. • Spill-control equipment appropriate to the type of waste stored in the area.
Step 7	Post the 90-Day Mixed Waste Accumulation Area with the following signs: • 90-Day Accumulation Area Warning Sign in the Hazardous Waste Management Subject Area • 90-Day Accumulation Area Rules Sign in the Hazardous Waste Management Subject Area • Radioactive Waste Accumulation Area Basic Rules Sign in the Radioactive Waste Management Subject Area • "No Smoking" • Emergency Contacts - listed in the Area's Contingency Plan.

Guidelines

A sufficient number of people should receive 90-Day Area Manager training to ensure coverage in the event of the Accumulation Area Manager's absence.

If a telephone is used to fulfill step 6, the area's location (Building Number, Room Number) should be posted adjacent to the telephone.

References

References

Hazardous Waste Management Subject Area

Radioactive Waste Management Subject Area

Radiological Control Manual Program Description

Training and Qualifications Web Site

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Subject Area: ***Mixed Waste Management***

6. Operating a 90-Day Mixed Waste Accumulation Area

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to 90-Day Accumulation Area Managers.

Required Procedure

Step 1	Ensure the Radioactive Waste Control Form(s) or Accountable Nuclear Material Waste Control Form(s) are completed prior to moving waste to the 90-Day Mixed Waste Accumulation Area.
Step 2	Ensure that the date the waste arrived in the 90-Day Mixed Waste Accumulation Area matches the date shown on the Mixed Waste Label. • Mixed waste must not be stored for more than ninety days in a 90-Day Mixed Waste Accumulation Area. It is the Area Manager's responsibility to ensure that the waste is removed within 90 days. **Note:** Notify Waste Management (WM) to remove waste at least one month before the 90-day accumulation expiration date.
Step 3	Submit the Radioactive Waste Control Form (RWCF) or Accountable Nuclear Material Waste Control Form (ANMWCF) and supporting characterization documentation (e.g., MSDS, analytical report, calculation, or indirect characterization methods) to the Waste Management (WM) Program for review and waste pick-up approval. If the RWCF or ANMWCF are not filled out correctly; or if the waste generator has not received proper training; or supporting characterization documentation has not been forwarded, WM will contact the generator and request additional information or return copies of the form along with an Incomplete Waste Control Form Notice, which prescribes the action to be taken, to the generator and the Waste Accumulation Area Manager. Maintain copies of all RWCFs or ANMWCFs for waste that is stored in the 90-

	Day Mixed Waste Accumulation Area.
Step 4	WM schedules the waste for pickup within 90 days of RWCF or ANMWCF approval. • If WM personnel are unable to locate the waste scheduled for pickup, they must notify the Mixed Waste Accumulation Area Manager and reschedule the pickup. • The rescheduled pickup should not lead to waste being staged for >90 days. **Note:** If waste has been staged for >90 days, generators or the Mixed Waste Accumulation Area Manager should contact the Mixed Waste Program Manager for immediate pickup.
Step 5	Prior to transporting waste, ensure packages/containers are tightly sealed. If the waste contains PCBs, see the section PCB Mixed Waste Management for additional instructions. • Handle and store waste containers to prevent leakage or spillage of the contents. • Containers are to be stored in an environment that will prevent the freezing of the contents or exposure to excessive heat. • Containers are not to be stored where the potential exists for leakage to enter sinks or drains. • Containers must remain in good condition, without holes, dents, or other faults.
Step 6	Inspect the area weekly by completing the approved 90-Day Hazardous/Mixed Waste Accumulation Area Weekly Inspection Checklist, and post the previous week's inspection results outside the area.
Step 7	Keep a current copy of the Contingency or Emergency Plan in the 90-Day Area as well as a second copy outside of, but directly adjacent to the area.
Step 8	Lock the 90-Day Mixed Waste Accumulation Area to limit access.

Guidelines

In accordance with DOE Order 435.1, *Radioactive Waste Management*, as implemented by the DOE-approved BNL Radioactive Waste Management Basis for Brookhaven National Laboratory in the Radioactive Waste Management Basis Program Description, routine radioactive waste may not be staged in generator facilities more than 90 days after the Radioactive Waste Control Form or Accountable Nuclear Material Waste Control Form (ANMWCF) in the Radioactive Waste Management Subject Area is approved by the Waste Management Program for pickup.

References

DOE Order 435.1, *Radioactive Waste Management*

Radioactive Waste Management Subject Area

Radioactive Waste Management Basis Program Description

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Subject Area: ***Mixed Waste Management***

7. PCB Mixed Waste Management

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all generators of PCB mixed waste and Accumulation Area Managers.

Required Procedure

Step 1	Ensure PCB mixed waste is picked up by Waste Management within 30 days of it being declared out of service. • The 30-day clock begins immediately after the first PCB waste is placed in a container, or as soon as a PCB article is declared waste.
Step 2	On the back of the Radioactive Waste Control Form (see the Radioactive Waste Management Subject Area), check "PCB" in the "State Regulated Materials" box and write "PCB Contamination" and the value in Parts Per Million (PPM) on the form's "Precautions" line.
Step 3	Completely de-energize PCB electrical devices prior to placing them in the waste accumulation area.
Step 4	Place PCB waste that is not in its original package into one of the following DOT shipping containers: • For debris, use a 55-gallon, open-top, steel drum (BNL Stock # K-60643) • For liquids, use a 55-gallon, bung steel drum (BNL Stock # K-60646) • For smaller articles, use a 5-gallon poly bucket (BNL Stock #K-60632)
Step 5	Ensure adequate spill control when transferring liquids containing PCBs from equipment of other containers.
Step 6	Affix the largest PCB Label (see the PCB Management Subject Area) on the item that will fit (maximum label size is 6"x6").
Step 7	Mark the out-of-service date of the PCB article or waste on the PCB Label.
Step 8	Segregate leaking PCB articles from nonleaking articles. **Note:** Segregate **nonleaking** small capacitors (capacitors that contain less than 1.36 kilograms [or 3 pounds] of dielectric fluid, or whose total volume is less than 100 cubic inches) and light ballasts from other PCB waste.

Step 9	Post a 6-inch PCB Label at the entrance to the waste accumulation area whenever PCB waste is stored within.
Step 10	Return to the section Operating a Mixed Waste Satellite Accumulation Area or the section Operating a 90-Day Mixed Waste Accumulation Area.

References

PCB Management Subject Area

Radioactive Waste Management Subject Area

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Subject Area: ***Mixed Waste Management***

8. Waste Certification

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Applicability

This information applies to all waste generators.

Required Procedure

DOE Order 435.1, *Radioactive Waste Management* requires the development, review, approval, and implementation of waste acceptance procedures for facilities that receive radioactive waste for storage, treatment, or disposal. Radioactive waste acceptance procedures establish the facility's requirements for the receipt, evaluation, and acceptance of waste. DOE Order 435.1 also requires that radioactive waste generators implement a program to address the characterization of waste, preparation of waste for transfer, certification that waste meets the receiving facility's radioactive waste acceptance requirements, and transfer of waste. Compliance with DOE Order 435.1 for the certification of radioactive waste to the receiving facility's waste acceptance requirements applies to both the on-site transfer of waste from the BNL generator's facility to Waste Management (WM) facilities, as well as the transfer of waste to off-site treatment, storage, or disposal facilities (TSDFs).

For on-site waste transfers, radioactive waste acceptance requirements are defined by the administrative, characterization, waste form, and packaging procedures within this subject area. The BNL waste generator's signature on the Radioactive Waste Control Form (RWCF) or Accountable Nuclear Material Waste Control Form (ANMWCF) represents the generator's certification statement that the waste meets the subject area requirements.

Only the WM Program can certify BNL mixed wastes prior to off-site transfer to treatment, storage, or disposal facilities (TSDFs). Waste certification is the process performed by WM affirming that a given waste or waste stream meets the waste acceptance criteria of the off-site TSDF, in accordance with the requirements of the BNL Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description. The WM Program maintains waste stream profiles for approved off-site TSDFs.

Step 1	Follow all procedures in this subject area to ensure mixed wastes are properly

	Follow all procedures in this subject area to ensure mixed wastes are properly managed and transferred to WM for waste certification and final disposition. **Note:** Use of non-DOE disposal facilities requires DOE approval of an exemption request. See Appendix A - Request for Use of Non-DOE Facility for Disposal of Radioactive Waste in the Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description.

References

DOE Order 435.1, *Radioactive Waste Management*

Radioactive Waste Management Basis Program Description

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Mixed Waste Generator Characterization Guidance

Contents

1.0 Mixed Waste Defined

Waste contaminated with radioactive components and at least one RCRA-listed hazardous constituent or exhibits a RCRA hazardous characteristic is mixed waste. See the Hazardous Waste Generator Characterization Guidance in the Hazardous Waste Management Subject Area for a detailed description of hazardous waste characterization and the Low-Level Waste Generator Characterization Guidance in the Radioactive Waste Management Subject Area for waste characterization.

All mixed waste must be characterized and accepted for transfer to a Waste Management (WM) facility and/or approved by WM for shipment to an off-site treatment, storage, or disposal facility. Your characterization will allow WM to safely handle, segregate, store, treat, and ship your waste off-site for disposition. Waste that is not properly characterized may be subject to rejection by WM.

To determine if your waste needs to be sampled and analyzed for radionuclides and/or for RCRA hazardous constituents, contact your Waste Management Representative (WMR), Environmental Compliance Representative (ECR) or the WM Radioactive Waste Program Manager for assistance.

A generator must know in advance that the process being used will create mixed waste, in accordance with the Work Planning and Control of Experiments and Operations Subject Area.

Contact your Environmental Compliance Representative (ECR) for assistance with planning work activities that may generate radioactive wastes.

It is important to prevent the creation of waste that contains both hazardous constituents and transuranic (TRU) radionuclides, because of limited storage and disposal facilities for TRU mixed waste. TRU waste is a radioactive waste containing greater than 100 nCi/g radioactive nuclides with an atomic number greater than 92.

TRU mixed waste requires special handling if it exhibits the characteristics of reactivity, corrosivity, or ignitability. Always notify WM before generating such waste. TRU mixed waste is not certifiable for disposal at WIPP, and would require treatment to remove any of these characteristics. Unless such treatment is available, such waste has no disposal path.

2.0 Process Knowledge

Because mixed waste contains both hazardous and radioactive components, check the EPA and NYSDEC lists to see if any of the chemical constituents are on the lists and if your waste exhibits any or all of the hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity. Also, see the Hazardous Waste Generator Characterization Guidance exhibit (2.0 Tools for Characterizing Hazardous Waste) in the Hazardous Waste Management Subject Area.

Waste generators through their knowledge of the process that generated the waste may characterize mixed waste that is generated at BNL. There are circumstances where the U.S. Environmental Protection Agency (EPA)/Ecology protocol sampling and analysis are not feasible or necessary for characterization of hazardous constituents (40 CFR 262.11, "Hazardous Waste Determination" [EPA 1987]). Under these circumstances, techniques that rely primarily on documented knowledge of raw materials, processes and material balances can be employed to characterize wastes. Such techniques may be employed when one or more of the following conditions are met.

- The waste stream is difficult to sample because of physical form. This primarily applies to pieces of metal (e.g., shielding) that contain hazardous constituents in their composition rather than as a residue that could be removed for testing or in a decontamination process.
- Sampling and analysis of the waste stream could result in unacceptable risks of radiation exposure (i. e., not consistent with the as low as reasonably achievable [ALARA] precept of DOE).
- Waste is too variable to be characterized by one set of samples (e.g., drums containing contaminated protective clothing, rags, and absorbent).
- Process knowledge is available and sufficiently documented to provide a complete characterization of the waste stream (e.g., MSDS, mass balances, etc.).

Process knowledge will not be accepted by WM unless it can be shown that the process producing the waste is rigidly controlled, such as through procedures governing waste segregation of input materials procurement. Through an understanding of the material input to a process and manner in which the material is manipulated or handled, the waste may be

characterized by use of a model that accounts for the quantities which will be included in the waste from that process. Appropriate documentation must accompany the Radioactive Waste Control Form (RWCF) or the Accountable Nuclear Material Waste Control Form (ANMWCF) in the Radioactive Waste Management Subject Area to show that the use of process knowledge is appropriate. Examples of appropriate documentation include:

- Interview information
- Logbooks
- Procurement records
- Qualified analytical data
- Radiation work packages
- Procedures and/or methods of accomplishment
- Process flow charts
- Inventory sheets
- Vendor information
- Mass balance from an uncontrolled process (e.g., spill cleanup)
- Mass balance from a process with variable inputs and outputs (e.g., washing/cleaning methods)
- Material Safety Data Sheets

If the information is sufficient to quantify constituents of regulatory concern and determine waste characteristics, as required by the regulations and TSDF waste acceptance criteria (WAC), the information is considered acceptable knowledge.

This information is documented on a Radioactive Waste Control Form (RWCF) or Accountable Nuclear Material Waste Control Form (ANMWCF) in the Radioactive Waste Management Subject Area, including supporting documentation, in accordance with the requirements in this subject area.

If you are performing a new process that will generate mixed waste, contact your area WMR, who can help you determine the appropriate documentation to complete.

3.0 Sampling and Analysis

Sampling and analysis may be required if

- Process knowledge is not available or adequate to completely characterize the waste, and/or
- You are uncertain as to whether regulated hazardous materials may be present.

The Analytical Services Laboratory (ASL) or an approved off-site laboratory will do the analyses in accordance with the generator defined sampling plan. Your WMR will provide assistance to determine the type of analysis required to characterize your waste and provide guidance on characterization procedures for unknown wastes.

You should provide the sampling personnel with as much information as possible about the composition of your waste. Before collecting the sample, the sampling technician or WMR

reviews the sampling method and strategy to determine if they are safe and appropriate for the waste.

There are several sampling methods for the various kinds of waste. The sampling method and devices used to sample a container of waste depend on the generator-supplied information. Requests for sampling are in accordance with the Environmental and Waste Management Services (EWMS) Division's procedure EM-SOP-105, Request for Sampling and Supplemental Health and Safety Plan, or an equivalent approved facility- or activity-specific procedure.

Sampling and analysis of waste is done according to a pre-approved sampling and analysis plan.

If you are generating mixed waste, and are unable to calculate its activity or determine its radionuclide level through process knowledge or waste assay, then you need to arrange for waste sampling. Contact your WMR for assistance.

Chain of Custody and Analytical Instructions (COC)

If your waste requires analysis, you are responsible for requesting that it be sampled and analyzed. Your WMR or ECR will assist you in filling out a COC, taking samples, and arranging for the appropriate analysis.

Waste samples used for the analytical characterization of the waste streams will be submitted to the onsite Analytical Services Laboratory (ASL) for screening for radioactivity and onsite analysis, or will be shipped to an approved contract laboratory for analysis. EM-SOP-109, Chain-of-Custody Procedure defines requirements for documenting the possession (custody) of samples from the point of collection to receipt of the sample by the analytical laboratory. This procedure also allows for providing waste analysis instructions. The RWCF/ANMWCF number and/or the container serial number for each waste package sampled will be recorded so that the sample is traceable to a specific waste parcel or container.

Sampling Methods

Provide the sampling personnel as much information about the composition of your waste as possible. This exchange is important because, before collecting the sample, the sampling technicians or WMR will select a sampling method and strategy that is safe and appropriate for the waste.

There are several sampling methods for the various kinds of waste. The sampling method and device used to sample waste depends on the generator-supplied information based on knowledge of the waste. Sampling must meet EPA SW-846 industry standards, or equivalent standards. EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, is a compilation of analytical and sampling methods that have been evaluated and approved for use in complying with the RCRA regulations. SW-846 functions primarily as a guidance document setting forth acceptable sampling methods. Information about other methods and analytical technologies may be accessed through the EPA's Technology Innovation Office Clu-In web page.

The ability to characterize waste adequately is based on obtaining enough samples to ensure that a representative population of samples is collected. The EPA has guidance documents, and methods are based on media being sampled. If a small amount of waste must be sampled (e.g., a drum), one sample may be all that is necessary if the waste is known to be homogeneous. Larger waste streams (e.g., soil piles), will require numerous samples. EWMS maintains the Environmental Monitoring SOPs web site and provides sampling guidance for environmental media that should be followed if applicable to your waste.

To ensure that each waste stream is characterized properly and that the analytical data is truly representative in nature the following table should be used for characterizing the different waste streams. The number of samples per waste stream is based on statistical methods and an acceptable deviation between the samples. A statistical analysis tool has been developed by WM (see Appendix A – Request for Use of Non-DOE Facility for Disposal of Radioactive Waste in the BNL Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description, and must be used to determine the number of samples needed for bulk waste streams such as soil. Preliminary data used for clean up level purposes may be used for screening, however unless all of the constituents required by the disposal site Waste Acceptance Criteria have been accounted for, further characterization samples will be mandatory.

4.0 Radionuclide Determination and Reporting

As a mixed waste generator, you are responsible for identifying all radionuclides present in your waste stream. Be sure to list all radionuclides on the RWCF or ANMWCF for your mixed waste, as specified in the Radioactive Waste Management Subject Area.

Radionuclide information is obtained from the analytical results or from generator calculations that are based on the curie content of each component in the waste. See the Low-Level and Transuranic Waste Generator Characterization Guidance in the Radioactive Waste Management Subject Area for a detailed description of radionuclide determination.

5.0 Documentation

Characterization Documentation

Before mixed waste can be transferred from the generator's facility to WM, a documentation package must be completed.

A documentation package contains information about the waste that enables WM to properly manage and track the waste and is required before transport to a WM facility.

The documentation package consists of

- Radioactive Waste Control Form or Accountable Nuclear Material Waste Control Form
- Radioactive Waste Inventory Form

- Sampling and analysis plan (if applicable)
- Analytical data (if applicable)
- Draft Waste Profiles (if applicable)

Instructions for preparing the required waste characterization documentation are provided in the this subject area.

Contact your area WMR, who can provide assistance in preparation of the appropriate documentation.

Material Safety Data Sheet (MSDS)

An MSDS is a basic source of information about hazardous chemicals. Each MSDS must list several characteristics of the chemical including

- Chemical identity as used on the container label
- Chemical and common names of all hazardous ingredients
- Physical and chemical characteristics of the hazardous ingredients
- Physical and health hazards of the hazardous ingredients, including exposure symptoms
- OSHA permissible exposure limit (PEL) and other exposure limits

An MSDS is a useful tool in helping to characterize surplus manufacturers' products because they should contain detail regarding hazardous components, physical data, ignitability, reactivity, health hazards, etc. However, if the product has been mixed or contaminated with other materials, the MSDS information may not apply.

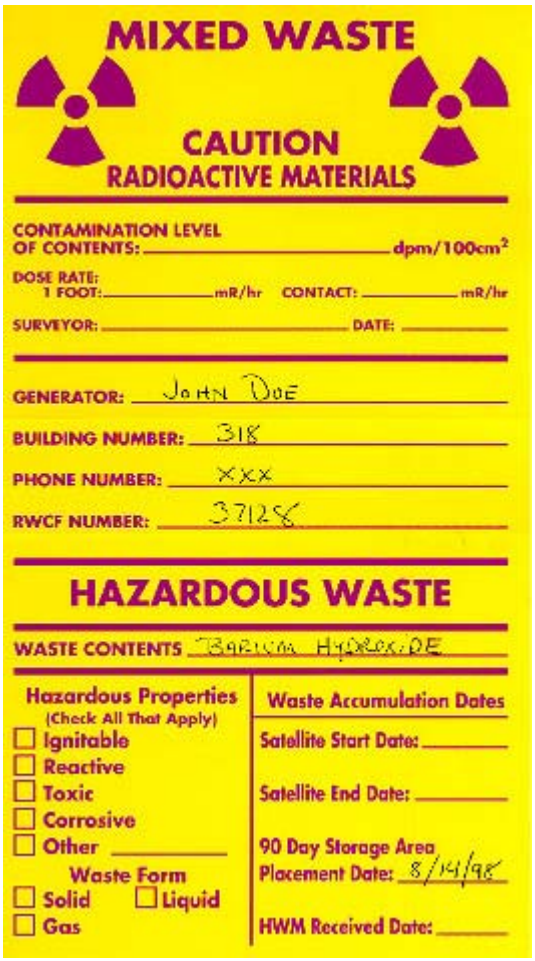
Contact your ECR or WMR if you cannot locate an MSDS. Keep all MSDSs for product material you replace for use in disposal of your waste. Refer to the BNL Material Safety Data Sheets (MSDS) Database Query web site for additional information.

Subject Area: ***Mixed Waste Management***

Mixed Waste Label

Effective Date: **February 2002**
Point of Contact: Mixed Waste Program Manager

To obtain the Mixed Waste Label, contact the Mixed Waste Program Manager.



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Subject Area: ***Mixed Waste Management***

Mixed Waste Yellow Bag

Effective Date: **December 2000**
Point of Contact: Mixed Waste Program Manager

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90 DAY HAZARDOUS/MIXED WASTE ACCUMULATION AREA WEEKLY INSPECTION CHECKLIST

Accumulation Area:_____

	Status: Sat.	Unsat.	N/A
1. Area is clearly identified with the following signs:			
a. "Hazardous Waste" sign	[ ]	[ ]	[ ]
b. "90-Day Area Rules"	[ ]	[ ]	[ ]
c. "No Smoking"	[ ]	[ ]	[ ]
d. "Radioactive Waste Rules" sign	[ ]	[ ]	[ ]
e. Emergency contacts	[ ]	[ ]	[ ]
2. All containers of hazardous waste are labeled with the words **"Hazardous Waste"**	[ ]	[ ]	[ ]
3. All containers of Mixed Waste must also contain the words **"Mixed Waste"**	[ ]	[ ]	[ ]
4. All waste has been placed in proper packagings or containers and are in good condition, labeled, and surveyed.	[ ]	[ ]	[ ]
5. All Mixed Waste bags are J-sealed, packages and containers are sealed and RWCFs or ANMWCFs have been completed for each item.	[ ]	[ ]	[ ]
6. All wastes have been segregated by hazard class (i.e., flammable, corrosive, active, or toxic).	[ ]	[ ]	[ ]
7. Spill control equipment is located in or adjacent to the Mixed Waste Accumulation Area.	[ ]	[ ]	[ ]
8. Area is bar coded by Waste Management, and bar code is in satisfactory condition.	[ ]	[ ]	[ ]
9. All sinks and floor drains in areas where Liquid Low-Level Mixed Waste is staged are plugged.	[ ]	[ ]	[ ]
9. Area is periodically surveyed and current dose rates are posted.	[ ]	[ ]	[ ]
10. Liquid wastes are in secondary containment and stored to prevent freezing or exposure to excessive heat.	[ ]	[ ]	[ ]
11. All containers clearly indicate the placement date and no waste has been staged for >90 days.	[ ]	[ ]	[ ]
12. An unobstructed (i.e., not behind locked doors, etc.) telephone, pull box, or handheld two-way radio is immediately available - located within line of sight or can be found by following a sign(s).	[ ]	[ ]	[ ]
13. An unobstructed type ABC fire extinguisher is within 30 feet of the 90-day area.	[ ]	[ ]	[ ]

14. A Type D fire extinguisher, similarly mounted, if area contains flammable metals.	[ ]	[ ]	[ ]
15. Current copy of Contingency or Emergency Plan, as well as second copy outside of, but directly adjacent to area.	[ ]	[ ]	[ ]
16. Containers holding PCBs are labeled with the largest PCB label and clearly marked with the out-of-service date.	[ ]	[ ]	[ ]
17. Out-of-service dates on PCB labels are less than 30 days.	[ ]	[ ]	[ ]
18. When PCBs are present in accumulation area, a sign indicating "PCB" is placed on wall (6" X 6") and taken down when PCBs are removed.	[ ]	[ ]	[ ]

Comments section. Document all corrective actions here (use reverse side if more room is needed):

_____
_____
_____
_____
_____
_____
_____

_____ _____

Hazardous/Mixed Waste Accumulation Area Manager Or Designee Signature

Date

Mixed Waste Accumulation Area Registration Form

Fill in the required information and send the form to Waste Management.

Department:

Building:

Location within building:

Area manager:

Phone extension:

Type(s) of mixed waste to be stored in area*:

Location of entrance to area and accessibility restrictions:

***Note:** **Examples of types of waste include hazardous constituents, Liquids, Drums, Compactible and Non-Compactible, and Low-Level Radioactive Waste (LLRW).**

Definitions: Mixed Waste Management

Effective Date: **August 2003**
Point of Contact: Mixed Waste Program Manager

Term	Definition
90-day Accumulation Area	A RCRA-regulated area designated by a Department/Division as the central accumulation point for any mixed wastes generated. Each 90-Day Accumulation Area must be established where it is convenient for the Department/Division, provided the procedures in this subject area are followed. Although there is no limit as to the quantity of mixed waste that can be accumulated in a 90-Day Accumulation Area, no waste container should be staged in the area for longer than ninety (90) days.
90-day Accumulation Area Manager	A person appointed by the Department/Division to control and oversee the day-to-day operations of one or more of the Department/Division's 90-Day Accumulation Area(s).
Accountable Nuclear Material Waste Control Form (ANMWCFs)	An Isotopes & Special Materials (I&SM) Group form for documenting shipping, tracking, and characterization of on-site waste, completed by waste generators for each container/package of radioactive or mixed waste (or for multiple containers/packages of the same waste) containing accountable material and used by Waste Management to track radioactive and mixed waste containing accountable material from pickup to final disposition. ANMWCFs are orange and identified by unique, sequential serial numbers.
acutely hazardous waste	Any waste regulated under Section 371.4(d)(5) of Title 6 of the New York Codes, Rules, and Regulations (6NYCRR) **or** any waste regulated under Section 371.4(b) and 371.4(c) with "H" Hazard Code in 6NYCRR.
Chemical Management System	A database that tracks surplus chemicals stored across the BNL site that are available for use by others in lieu of purchasing new materials.
contingency plan	A document setting out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of mixed waste or hazardous waste constituents that could threaten human health or the environment.
Decay in Storage (DIS)	Storage of radioactive waste for a period of time sufficient for radionuclide(s) of concern to be reduced in activity, by radioactive decay, to a level of lower concern. DIS must be accomplished in accordance with the requirements of this subject area.
empty containers of hazardous waste	A container is empty when all wastes have been removed from the container (using practices commonly employed to remove materials

	from that type of container, e.g., pouring, pumping, and aspirating), so that no more than 3% (0.3% for containers greater than 110 gallons) by weight of the total capacity remains in the container. A good rule of thumb is that less than one inch of residue can remain in a 55 gallon drum. A cylinder holding a compressed gas is empty when the internal presser approaches atmospheric pressure. **Note:** This definition does not apply to acutely hazardous wastes. Empty containers of acutely hazardous wastes must be treated as hazardous.
generator's certification statement	A statement signed by the waste generator on a waste control form that says (or certifies) that the waste meets the administrative, characterization, waste form, and packaging requirements defined within this subject area.
hazard class	Classification of a hazardous material or waste based on its primary hazardous characteristic. Hazard Classes include acids, bases, flammables, oxidizers, air reactives, water reactives, poisons/toxics (pesticides, inhalation hazards, cyanides), and organic peroxides. A material may meet the defining criteria for more than one hazard class, but is assigned to only one hazard class.
hazardous waste	By-product of certain BNL processes and activities that can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous waste possesses at least one of four characteristics (ignitability, corrosivity, reactivity, and toxicity), or appears on special EPA lists.
industrial waste	Any liquid, gas, or solid waste resulting from an industrial process that may cause pollution. Industrial waste is not regulated as hazardous waste, but requires local or State approval for disposal to a landfill or resource recovery facility. Examples include non-hazardous waste oil, oil spill debris, ion exchange resin columns, and non-friable asbestos.
mixed waste	Low-Level Radioactive Waste (LLRW) that also contains hazardous waste.
Mixed Waste Accumulation Area Manager	A person appointed by the Department/Division to control and oversee the day-to-day operations of one or more of the Department/Division's Mixed Waste Accumulation Area (s).
PCBs	Polychlorinated biphenyls. Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination of substances that contains such substance.
point of generation	A discernible, discrete location within a process or facility where one or more mixed wastes are generated.
pollution prevention	The reduction or prevention of a hazardous or radioactive substance, pollutant, or contaminant from entering a waste stream or otherwise from being released to the environment before recycling or treatment.
Radioactive Material Area	An area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material or an area that is exposed to beams or other sources of particles (neutrons, protons, etc.) capable of causing activation.
radioactive waste	Any garbage, refuse, sludges, and other discarded material, including solid, liquid, semisolid, or contained gaseous material that must be managed for its radioactive content. Any waste managed for its radioactive content that is not otherwise regulated for that radioactive content (e.g., waste released through permitted discharges to the environment). If a material was received as nonradioactive, any resulting waste is not a radioactive waste if it meets the following conditions:

	a. The waste contains no surface radioactivity above the limits established in DOE Orders or guidance [e.g. surface contamination limits and requirements of DOE Order 5400.5, Radiation Protection of the Public and Environment, Table II.5.c(1)] or successor documents; **And** b. The waste contains no measurable increase in radioactivity (at a statistically defined confidence interval) above background in volume or bulk resulting from BNL operations, as determined by Radiological Controls Division's Facility Support Representative utilizing approved procedures, and is approved for release. **Note:** Materials received as nonradioactive that may contain naturally occurring radioactivity (for example, refractory brick, diatomaceous earth, or kitty litter) may be disposed of as non-radioactive waste providing the radioactivity has not been concentrated or enhanced by BNL operations, as determined by implementation of approved BNL procedures.
Radioactive Waste Accumulation Area	An area designated by a Department/Division as the central accumulation point for any radioactive wastes awaiting pick-up. Each Radioactive Waste Accumulation Area must be established where it is convenient for the Department/Division, provided the procedures in this subject area are followed.
radioactive waste classification	Term used to describe the different 'classes' of radioactive waste, as defined below: **Low-Level Radioactive Waste (LLRW)** is radioactive waste not classified as high-level waste, transuranic waste, spent nuclear fuel, or by-product material as defined below. **Mixed Waste** is LLRW that also contains hazardous waste. See the Mixed Waste Subject Area for further details. **By-product Material** is categorized as either (1) any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material; or (2) the tailings or waste produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. **High-level waste** is the highly radioactive waste material that results from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing, and any solid waste derived from the liquid that contains a combination of transuranic waste and fission products in quantities requiring permanent isolation or other materials for which it has been determined require permanent isolation.

	permanent isolation. **Transuranic (TRU) waste** is any waste, without regard to source or form, that is contaminated with alpha-emitting transuranic radionuclides (elements 93 and higher) with half-lives greater than 20 years and concentrations greater than 100 nCi/g at the time of assay. Radioactive waste with quantities of transuranic radionuclides in concentrations of 100 nCi/g of waste or less is considered to be LLRW and not TRU waste. **Note:** The Waste Management Division is **not** approved to dispose of high-level waste or TRU waste without an approved path for disposal. Special arrangements must be made prior to generation. Contact the Waste Management Program if you suspect you may have already generated TRU waste. **Accountable Nuclear Material/Waste** is waste containing depleted, normal, and enriched uranium, U-233, plutonium, Am-241, Am-243, Cm, Cf-252, Bk-249, Np-237, Li-6, thorium, tritium gas, and deuterium as heavy water.
Radioactive Waste Control Form (RWCF)	A Waste Management (WM) Program form for documenting shipping, tracking, and characterization of on-site waste, completed by waste generators for each container/package (or group of similar packages) of radioactive or mixed waste, and used by WM to track the waste from pickup to final disposition. RWCFs are identified by unique, sequential serial numbers.
Radioactive Waste Inventory Form	A form used by the waste generator to record additions of radioactive waste to each package at the point of generation.
Resource Conservation and Recovery Act (RCRA)	The federal law originally passed in 1976 and amended in 1984 that in part, addressed the generation, treatment, storage, and disposal of hazardous wastes in order to protect human health and the environment.
Satellite Accumulation Area	A RCRA-regulated area designated as the initial point of accumulation for any mixed wastes generated. Each Satellite Accumulation Area must be located at or near the point in a process or facility where hazardous waste(s) is generated. No more than a total of 55 gallons (7.5 cubic feet or 210 liters) of mixed waste **or** one quart (950 milliliters) of acutely hazardous (mixed) waste is stored within each Satellite Area. Each waste stream resulting from a specific process may have its own Satellite Accumulation Area.
segregation of waste	The process of separating, or keeping separate, individual waste types and forms in order to facilitate their cost-effective treatment, storage, or disposal.
short half-life isotopes	Isotopes with a half-life less than 90 days.
source material	Depleted uranium, normal uranium, thorium, or any other nuclear material determined, pursuant to Section 61 of the Atomic Energy Act of 1954, as amended, to be source material; or ores containing one or more of the above materials in such concentration as may be determined by regulation.
Special Nuclear Material (SNM)	Plutonium, uranium-233, uranium enriched in the isotope 235, and any other material which, pursuant to Section 51 of the Atomic Energy Act of 1954, as amended, has been determined to be SNM, but does not include source material; it also includes any material

	artificially enriched by any of the above, not including source material.
staging	Storing waste (< 90 days) for the purpose of accumulation to facilitate transportation transfer, treatment, and/or disposal.
State Regulated Low-Level Radioactive Waste (LLRW)	LLRW contaminated with substances regulated by the State where the off-site disposal facility is located. For the purposes of this subject area, LLRW contaminated with oils, chelating compounds, organic solvents, halogenated organics, polycyclic aromatic hydrocarbons, carcinogens, mutagens, or toxic compounds constitute State Regulated LLRW. State Regulated LLRW may be stored in a Radioactive Waste Accumulation Area as long as it is segregated from regular LLRW by means of a physical barrier (e.g., wall), or is held in a partitioned area (e.g., a floor taped to show separation). For further information on State Regulated LLRW, contact the Environmental Subject Matter Expert.
storage	The holding of radioactive waste for a temporary period, at the end of which the waste is treated, disposed of, or stored elsewhere.
treatment	Any method, technique, or process designed to change the physical or chemical character of waste to render it: less hazardous; safer to transport, store, or dispose of; or reduce its volume.
treatment, storage, or disposal facilities (TSDF)	An approved facility for the treatment, storage, or disposal of radioactive, mixed, or hazardous waste.
waste acceptance criteria (WAC)	Waste acceptance criteria are the technical and administrative requirements that a waste must meet in order for it to be accepted at a storage, treatment, or disposal facility.
waste characterization	The identification of waste composition and properties, by review of acceptable knowledge (which includes process knowledge), or by nondestructive examination, nondestructive assay, or sampling and analysis, to comply with applicable storage, treatment, handling, transportation, and disposal requirements.
waste certification	A process by which the Waste Management (WM) Program affirms that a given waste or waste stream meets the waste acceptance criteria of the offsite facility to which the waste will be transferred. The WM Program is responsible for certification of all BNL radioactive wastes for offsite transfer for treatment, storage, or disposal, in accordance with the requirements of the BNL Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description.
waste generator	Any person whose activity at BNL produces a mixed waste, acutely hazardous (mixed) waste, or other wastes managed by the WM Program.
waste minimization	A waste management approach that focuses on preventing or reducing the generation of pollutants, contaminants, or wastes at the source.
waste package verifier	A qualified WM individual responsible for independently verifying that an approved waste container and packaging materials are used for packaging waste, and that the contents of a waste package are properly documented by the waste generator and are in compliance with the applicable waste acceptance criteria.

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Revision History: Mixed Waste Management

Point of Contact: Mixed Waste Program Manager

Revision History of this Subject Area

Date	Description	Management System
August 2003	The subject area was revised to include corrective actions identified in the DOE Order 435.1, *Radioactive Waste Management* Assessment conducted in May 2002. These include the following • Characterization methodologies; • Staging and storage requirements; • Contingency storage applicability; • Waste acceptance criteria; • Waste certification. The Contents section was revised to reflect the change in section order. The section Waste Certification was revised to clarify the term "certification" for on-site and off-site waste transfers. The reference to the Low-Level Waste Certification Program Plan (LLWCPP) was replaced with the Waste Certification Program Plan (WCPP) in the Radioactive Waste Management Basis Program Description. The reference to the revised Radioactive Waste Management Basis (RWMB) for Brookhaven National Laboratory document was modified to reflect its new location in the Radioactive Waste Management Basis Program Description. The definition of "Radioactive Waste" was appended to include the definition from DOE O 435.1, *Radioactive Waste Management*	Environmental Management System

	O 435.1, *Radioactive Waste Management*. Definitions for "staging," "storage," and "treatment" were added. The definition for "certification statement" was modified to "generator's certification statement."	
February 2002	The Contents section was revised to add a reference to the BNL Low-Level Waste Certification Program Plan (LLWCPP). The Introduction section was revised to include BNL's compliance with DOE Order 435.1 in accordance with the DOE-approved Radioactive Waste Management Basis (RWMB) document. The Generating Waste section was revised to include the following requirements: • Wastes that are packaged by the waste generator require point of generation inspection by the Waste Management Division. • Final waste loads must have an even load distribution. References to the Low-Level Waste Certification Program Plan (LLWCPP) and the Radioactive Waste Management Basis (RWMB) were added to the section. The Completion of the Waste Control Form section was revised to add the following requirements: • Waste weights are to be recorded in grams or hundredths of a pound for light, higher activity items (weighing less than 1 1b.). and • The identification of elemental zinc if TCLP is required. The new Mixed Waste Generator	Environmental Management System

	The new Mixed Waste Generator Characterization Guidance exhibit was added to the subject area and referenced in the section. The Operating a 90-Day Mixed Waste Accumulation Area section was revised to document the DOE Order 435.1 requirement that waste not be staged longer than 90 days. The Waste Certification section was revised to remove the sentence stating that all radioactive waste is transferred to the Waste Management Facility. The word "hazardous" was changed to "mixed" and the acronym "TSDF" was added to explain the off-site transfer of waste to treatment, storage, or disposal facilities. The Low-Level Waste Certification Program Plan (LLWCPP) and Exemption Request for Use of Non-DOE LLW Disposal Facility form were added as references. The Definitions section was revised to include a reference to the Low-Level Waste Certification Program Plan (LLWCPP) in the definition for "waste certification." The definitions for the "Accountable Nuclear Material Waste Control Form (ANMWCF)" and the "Radioactive Waste Control Form (RWCF)" were modified to be consistent with the WMD-SOP-510 definition. A definition was added for "treatment, storage, or disposal facilities (TSDF)."	
December 2000	The Waste Certification section was added to the subject area to clarify the responsibility of the Waste Management Division for certifying all BNL radioactive wastes prior to off-site transfer for treatment, storage, or disposal. The following terms were added to the Definitions section: "certification statement," "waste acceptance criteria," "waste characterization," and "waste certification." The Point of Contact for the subject area sections was updated.	Environmental Management System
March 1999	This subject area replaces ES&H Standard 6.2.2 Section IV C 1.	Environmental Management System

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